Exhibit D

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EDUCATION

Ph.D. 1993	Electrical Engineering, University of Maryland, College Park, Maryland.
B.Sc. 1982	Electrical Engineering, Cornell University, Ithaca, New York.

RESEARCH AND TEACHING

September 2004 - present
University Lecturer in Speech Processing
Speech Group, Machine Intelligence Laboratory
Information Engineering Division
Department of Engineering
Cambridge University

July 2005 - present
Fellow, Clare College
Cambridge University

2000 - present
1994 - 2000
Research Associate Professor (part-time from September 2004)
Associate Research Scientist
Center for Language and Speech Processing and
Department of Electrical and Computer Engineering
The Johns Hopkins University
Barton Hall, 3400 North Charles Street, Baltimore, MD. 21218 U.S.A.

Research Engineer & Consultant 1990 - present
Voice Signal Technologies, Woburn, MA, USA (2000 - 2002, part-time). Participated in the development of automatic speech recognition for embedded applications.

Entropic Research Laboratories, Washington, DC USA (1990-1994, part-time). Responsible for HTK, a Hidden Markov Model Toolkit. Participated in the development of ESPS and xWaves, a C/UNIX signal processing software system. Developed signal processing routines with an emphasis on speech processing applications.

Division of Computer Research and Technology, National Institutes of Health, Bethesda, MD USA (1983-1984, 1986). Developed microcomputer-based biomedical instrumentation.

RESEARCH FOCUS
Automatic speech recognition (estimation procedures for acoustic modeling, rapid and robust acoustic adaptation, multilingual and accented speech processing, pronunciation modeling, accent and dialect modeling), statistical machine translation (finite state machine implementations, estimation and decoding procedures), information retrieval (spoken document retrieval), information theory (information geometry, estimation).

TEACHING	Cambridge University Engineering Department Speech – Speech Processing (4F11) Masters in Computer Speech, Text and Internet Technology Program – Speech 1, Dialog Systems B, Internet Applications B, Speech Reading Club

Automatic Speech Processing and Recognition (JHU ECE475/ECE678), Introduction to the Theory and Practice of Large Vocabulary Speech Recognition (JHU ECE478), Advanced Topics in Speech Science and Technology (JHU ECE776)

Regular instructor in speech and acoustic processing at the yearly CLSP Summer Workshop on Language Engineering sponsored by NSF and the North American Chapter for the Association of Computational Linguistics (NAACL) (1998–2003)

CURRENT AND RECENT SPONSORED RESEARCH PROJECTS AS PI OR Co-PI

BYRNE, WILLIAM. Statistical Phrase Based Speech Translation, Microsoft Research Inc. Unrestricted research gift to CUED, 2005.

BYRNE, WILLIAM. Statistical Phrase Based Speech Translation, Google Inc. Unrestricted research gift to CUED, 2005.

BYRNE, WILLIAM (PI), JAMES MAYFIELD, PAUL MCNAMEE. Integrated Cross-Language Spoken Document Retrieval, JHU Whiting School Development Award, 2002–2004.

BYRNE, WILLIAM (PI). ELAN Speech Triage Consultation, Department of Defense, 2002-2003

JELINEK, FREDERICK (PI), WILLIAM BYRNE, JASON EISNER, SANJEEV KHUDANPUR, DAVID YAROWSKY. Summer Workshops on Human Language Technology: Integrating Research and Education (WS02 - WS06), NSF ITR (Medium), 2002-2006

GUSTMANN, SAMUEL (PI), WILLIAM BYRNE (LEAD PI AT JHU), DOUGLAS OARD, BHUVANA RHAMABHADRAN, MICHAEL PICHENEY. MALACH: Multilingual Access to Large Spoken Archives from the Holocaust, NSF ITR (Large), 2001-2006

JELINEK, FREDERICK (PI), WILLIAM BYRNE, JASON EISNER, SANJEEV KHUDANPUR, DAVID YAROWSKY. University Center for Language and Speech Processing, Department of Defense, 2001-2005

YAROWSKY, DAVID (PI), WILLIAM BYRNE, SANJEEV KHUDANPUR, PHILIP RESNIK. Improving Statistical Translation Models via Text Analyzers Trained from Parallel Corpora, Office of Naval Research Multiple University Research Initiative, 2001-2006

JELINEK, FREDERICK (PI), WILLIAM BYRNE, SANJEEV KHUDANPUR. Language Engineering Workshop for Students and Professionals (WS01), NSF, 2001-2002

JELINEK, FREDERICK (PI), WILLIAM BYRNE, SANJEEV KHUDANPUR. Robust Knowledge Discovery from Parallel Speech and Text Sources, DARPA TIDES, 2000-2003

OARD, DOUGLAS (PI), WILLIAM BYRNE (LEAD PI AT JHU), SANJEEV KHUDANPUR, PHILIP RESNIK, DAVID YAROWSKY. Translingual Information Detection, Extraction and Summarization, DARPA TIDES, 2000-2005

PICONE, JOSEPH (PI), WILLIAM BYRNE, EUGENE CHARNIAK, FREDERICK JELINEK, MARK JOHNSON, SANJEEV KHUDANPUR, MARI OSTENDORF. Integrat-

ing Prosody, Speech Recognition, Parsing in Spoken-Language Information Retrieval, NSF ITR, 2000-2004

DISSERTATION AND RESARCH SUPERVISION

Yonggang Deng, Ph.D. in Electrical and Computer Engineering, JHU, 2005
Title: Bitext Chunk Alignment for Statistical Machine Translation

Stavros Tsakalidis, Ph.D. in Electrical and Computer Engineering, JHU, 2005
Title: Linear Transforms in Automatic Speech Recognition: Discriminative Estimation Procedures and Integration of Diverse Acoustic Data

Veera Venkataramani, Ph.D. in Electrical and Computer Engineering, JHU, 2005
Title: Support Vector Machines For Segmental Minimum Bayes Risk Decoding Of Continuous Speech

Vlasios Doumpiotis, Ph.D. in Electrical and Computer Engineering, JHU, 2005
Title: Discriminative Training for Speaker Adaptation and Minimum Risk Estimation in Large Vocabulary Conversational Speech Recognition

Shankar Kumar, Ph.D. in Electrical and Computer Engineering, JHU, 2005
Title: Minimum Bayes-Risk Techniques in Automatic Speech Recognition and Machine Translation

Asela Gunawardana, Ph.D. in Electrical and Computer Engineering, JHU, 2001
Title: The Information Geometry of EM Variants for Speech and Image Processing

Vaibhava Goel, Ph.D. in Biomedical Engineering, JHU, 2001
Title: Minimum Bayes-Risk Automatic Speech Recognition

John McDonough, Ph.D. in Electrical and Computer Engineering, JHU, 2000
Title: Speaker Compensation with All-Pass Transforms

Currently supervising Dr. Izhak Shafran, Assistant Research Scientist, CLSP, JHU
Currently supervising Dr. Hichem Sahbi, Research Associate, MIL, CUED

CURRENT AND RECENT PROFESSIONAL ACTIVITIES

Associate Editor, IEEE Transactions on Speech, Audio, and Language Processing, 2006 – 2008 (Major Subject Area – Speech Translation)

Member, External Advisory Board, "MURI Award N000140510388: Human-like Speech Processing", Prof. J. Bilmes (Univ. Washington) PI, 2005-2010

Member, External Review Panel, "NCCR IM2 National Centres of Competence in Research: Interactive Multimodal Information Management", Swiss National Science Foundation, Prof. H. Bourlard, PI

Associate Editor, ACM Transactions on Speech and Language Processing, January 2005 – December 2007

Invited participant, NSF-ELTE Ithaka sponsored Hungarian US R&D Workshop, Budapest, Hungary, March 2004

Elected Member, IEEE Signal Processing Society Speech Technical Committee, January 2004 - December 2006

Co-Editor (with Daniel Jurafsky and Eric Fosler-Lussier), Special Issue of Speech Communication on Pronunciation Modeling and Lexicon Adaptation

Co-Chair (with Jeffrey Bilmes) IEEE Automatic Speech Recognition and Understanding Workshop, December 2003

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Co-Chair (with Daniel Jurafsky and Eric Fosler-Lussier) ISCA ITR-Workshop on Pronunciation Modeling and Lexicon Adaptation for Spoken Language Technology, September 2002

Program committee, NAACL Conference on Human Language Technologies, 2003 and ISCA ITR-Workshop on Multilingual Spoken Document Retrieval, 2003

Reviewer for IEEE Transactions on Information Theory; IEEE Transactions on Speech and Audio Processing; Computer, Speech and Language; Speech Communication; Journal of Computational and Graphical Statistics; Journal of Machine Learning Research

COLLABORATORS   E. Charniak (Brown U.), B. Dorr (U. Maryland), D. Greenberg (Survivors of the Shoah Visual History Foundation), S. Gustmann (Survivors of the Shoah Visual History Foundation), J. Hajic (Charles U.), T. Hoffman (Brown U.), M. Johnson (Brown U.), D. Jurafsky (Stanford U.), D. Oard (U. Maryland), M. Ostendorf (U. Washington), M. Picheny (IBM) J. Picone (Miss. State), J. Psutka (U. West Bohemia), B. Ramabhadran (IBM), P. Resnik (U. Maryland), D. Soergel (U. Maryland), R. Sproat (U. Illinois), A. Weinberg (U. Maryland), F. Zheng (Tsinghua U.)

PUBLICATIONS – Journal Articles and Book Chapters

[1]   V. VENKATARAMANI, S. CHAKRABARTTY, AND W. BYRNE. *Gini*support vector machines for segmental minimum Bayes risk decoding of continuous speech. *Computer Speech and Language.* Accepted, in Revision.

[2]   S. TSAKALIDIS AND W. BYRNE. Cross-corpus normalization of diverse acoustic training data for robust hmm training. *Speech Communication.* Submitted.

[3]   S. KUMAR, Y. DENG, AND W. BYRNE. A weighted finite state transducer translation template model for statistical machine translation. *Journal of Natural Language Engineering.* To appear. Published Online 6 December 2005.

[4]   Y. DENG, S. KUMAR, AND W. BYRNE. Segmentation and alignment of parallel text for statistical machine translation. *Journal of Natural Language Engineering.* Accepted. To appear.

[5]   W. BYRNE. Minimum Bayes risk estimation and decoding in large vocabulary continuous speech recognition. *Proceedings of the Institute of Electronics, Information, and Communication Engineers, Japan – Special Section on Statistical Modeling for Speech Processing.* Invited paper. To appear in 2006.

[6]   J. LI, F. ZHENG, W. BYRNE, AND D. JURAFSKY. A dialectal Chinese speech recognition framework. *Journal of Computer Science and Technology (Science Press, Beijing, China),* (1):106–115, January 2006.

[7]   A. GUNAWARDANA AND W. BYRNE. Convergence theorems for generalized alternating minimization procedures. *Journal of Machine Learning Research,* (6):2049–2073, December 2005.

[8]   V. DOUMPIOTIS, S. TSAKALIDIS, AND W. BYRNE. Discriminative linear transforms for feature normalization and speaker adaptation in HMM estimation. *IEEE Transactions on Speech and Audio Processing,* 13(3), May 2005.

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[9] V. DOUMPIOTIS AND W. BYRNE. Lattice segmentation and minimum Bayes risk discriminative training for large vocabulary continuous speech recognition. *Speech Communication*, (2):142–160, 2005.

[10] V. GOEL, S. KUMAR, AND W. BYRNE. Segmental minimum Bayes-risk decoding for automatic speech recognition. *IEEE Transactions on Speech and Audio Processing*, May 2004.

[11] W. BYRNE, D. DOERMANN, M. FRANZ, S. GUSTMAN, J. HAJIČ, D. OARD, M. PICHENY, J. PSUTKA, B. RAMABHADRAN, D. SOERGEL, T. WARD, AND W.-J. ZHU. Automatic recognition of spontaneous speech for access to multilingual oral history archives. *IEEE Transactions on Speech and Audio Processing, Special Issue on Spontaneous Speech Processing*, July 2004.

[12] V. GOEL AND W. BYRNE. Minimum Bayes-risk automatic speech recognition. In W. Chou and B.-H. Juang, editors, *Pattern Recognition in Speech and Language Processing*. CRC Press, 2003.

[13] F. ZHENG, Z. SONG, P. FUNG, AND W. BYRNE. Mandarin pronunciation modeling based on the CASS corpus. *Journal of Computer Science and Technology (Science Press, Beijing, China)*, 17(3), May 2002.

[14] A. GUNAWARDANA AND W. BYRNE. Discounted likelihood linear regression for rapid speaker adaptation. *Computer Speech and Language*, 15(1):15–38, Jan 2001.

[15] V. GOEL AND W. BYRNE. Minimum Bayes-Risk automatic speech recognition. *Computer Speech and Language*, 14(2):115–135, 2000.

[16] W. BYRNE AND A. GUNAWARDANA. Comments on 'Efficient training algorithms for HMM's using incremental estimation'. *IEEE Transactions on Speech and Audio Processing*, 8(6):751–754, Nov 2000.

[17] M. RILEY, W. BYRNE, M. FINKE, S. KHUDANPUR, A. LJOLJE, J. MCDONOUGH, H. NOCK, M. SARACLAR, C. WOOTERS, AND G. ZAVALIAGKOS. Stochastic pronunciation modeling from hand-labelled phonetic corpora. *Speech Communication*, November 1999.

[18] W. BYRNE AND S. SHAMMA. Neurocontrol in sequence recognition. In O. Omidvar and D. Elliott, editors, *Progress in Neural Networks: Neural Networks for Control*. Academic Press, 1997.

[19] S. YOUNG, P. WOODLAND, AND W. BYRNE. Spontaneous speech recognition for the credit card corpus using the HTK toolkit. *IEEE Transactions on Speech and Audio Processing*, 1994.

[20] W. BYRNE. Alternating Minimization and Boltzmann Machine learning. *IEEE Transactions on Neural Networks*, 3(4):612–620, 1992.

[21] W. BYRNE, R. ZAPP, P. FLYNN, AND M. SIEGEL. Adaptive filter processing in remote heart monitors. *IEEE Transactions on Biomedical Engineering*, July 1986.

Workshops and Conferences

[1] L. MATHIAS AND W. BYRNE. Statistical phrase-based speech translation. In *IEEE Conference on Acoustics, Speech and Signal Processing*, 2006. Accepted. To appear.

[2] V. VENKATARAMANI AND W. BYRNE. Lattice segmentation and support vector machines for large vocabulary continuous speech recognition. In *IEEE Conference on Acoustics, Speech and Signal Processing*, 2005.

[3] S. TSAKALIDIS AND W. BYRNE. Acoustic training from heterogeneous data sources: Experiments in Mandarin conversational telephone speech transcription. In *IEEE Conference on Acoustics, Speech and Signal Processing*, 2005.

[4] J. PSUTKA, P. IRCING, J.V. PSUTKA, J. HAJIC, W. BYRNE, AND J. MIROVSKI. Automatic transcription of Czech, Russian, and Slovak spontaneous speech in the MALACH project. In *Proceedings of EUROSPEECH*, 2005.

[5] S. KUMAR AND W. BYRNE. Local phrase reordering models for statistical machine translation. In *Proceedings of HLT-EMNLP*, 2005.

[6] Y. DENG AND W. BYRNE. HMM word and phrase alignment for statistical machine translation. In *Proceedings of HLT-EMNLP*, 2005.

[7] I. SHAFRAN AND W. BYRNE. Task-specific minimum Bayes-risk decoding using learned edit distance. In *Proc. of the International Conference on Spoken Language Processing*, 2004.

[8] J. PSUTKA, P. IRCING, J. HJIC, V. RADOVA, J.V. PSUTKA, W. BYRNE, AND S. GUSTMAN. Issues in annotation of the czech spontaneous speech corpus in the MALACH project. In *Proceedings of the International Conference on Language Resources and Evaluation (LREC)*, 2004.

[9] J. PSUTKA, J. HAJIC, AND W. BYRNE. Slavic languages in the MALACH project. In *IEEE Conference on Acoustics, Speech and Signal Processing*. IEEE, 2004. *Invited Paper in Special Session on Multilingual Speech Processing*.

[10] S. KUMAR AND W. BYRNE. Minimum Bayes-risk decoding for statistical machine translation. In *Proceedings of HLT-NAACL*, 2004.

[11] V. DOUMPIOTIS AND W. BYRNE. Pinched lattice minimum Bayes risk discriminative training for large vocabulary continuous speech recognition. In *Proc. of the International Conference on Spoken Language Processing*, 2004.

[12] W. BYRNE. Minimum Bayes risk estimation and decoding in large vocabulary continuous speech recognition. In *Proceedings of the ATR Workshop "Beyond HMMs"*, Kyoto, Japan, 2004. Invited paper.

[13] V. VENKATARAMANI, S. CHAKRABARTTY, AND W. BYRNE. Support vector machines for segmental minimum Bayes risk decoding of continuous speech. In *IEEE Automatic Speech Recognition and Understanding Workshop*, 2003.

[14] J. PSUTKA, P. IRCING, J.V. PSUTKA, V. RADOVIC, W. BYRNE, J. HAJIC, JIRI MIROVSKY, AND SAMUEL GUSTMAN. Large vocabulary ASR for spontaneous Czech in the MALACH project. In *Proc. of the European Conference on Speech Communication and Technology (EUROSPEECH)*, 2003.

[15] J. PSUTKA, P. IRCING, J. V. PSUTKA, V. RADOVA, W. BYRNE, J. HAJIC, AND S. GUSTMAN. Towards automatic transcription of spontaneous Czech speech in the MALACH project. In *Proceedings of the Text, Speech, and Dialog Workshop*, 2003.

[16] J. PSUTKA, I. ILJUCHIN, P. IRCING, J.V. PSUTKA, V. TREJBAL, W. BYRNE, J. HAJIC, AND S. GUSTMAN. Building LVCSR systems for transcription of spontaneously produced Russian witnesses in the MALACH project: initial steps and first results. In *Proceedings of the Text, Speech, and Dialog Workshop*, 2003.

[17] D. OARD, D. DOERMANN, B. DORR, D. HE, P. RESNIK, W. BYRNE, S. KHUDANPUR, D. YAROWSKY, A. LEUSKI, P. KOEHN, AND K. KNIGHT. Desperately seeking Cebuano. In *Proceedings of HLT-NAACL*, 2003.

[18] S. KUMAR AND W. BYRNE. A weighted finite state transducer implementation of the alignment template model for statistical machine translation. In *Proceedings of HLT-NAACL*, 2003.

[19] O. KOLAK, W. BYRNE, AND P. RESNIK. A generative probabilistic OCR model for NLP applications. In *Proceedings of HLT-NAACL*, 2003.

[20] A. IKENO, B. PELLOM, D. CER, A. THORNTON, J. M. BRENIER, D. JURAFSKY, W. WARD, AND W. BYRNE. Issues in recognition of Spanish-accented spontaneous English. In *Proceedings of the ISCA and IEEE workshop on Spontaneous Speech Processing and Recognition*, Tokyo Institute of Technology, Tokyo, Japan, 2003. ISCA and IEEE.

[21] V. DOUMPIOTIS, S. TSAKALIDIS, AND W. BYRNE. Discriminative training for segmental minimum Bayes-risk decoding. In *IEEE Conference on Acoustics, Speech and Signal Processing*. IEEE, 2003.

[22] V. DOUMPIOTIS, S. TSAKALIDIS, AND W. BYRNE. Lattice Segmentation and Minimum Bayes Risk Discriminative Training. In *Proc. of the European Conference on Speech Communication and Technology (EUROSPEECH)*, 2003.

[23] W. BYRNE, S. KHUDANPUR, W. KIM, S. KUMAR, P. PECINA, P.VIRGA, P. XU, AND D. YAROWSKY. The Johns Hopkins University 2003 Chinese-English Machine Translation System. In *Machine Translation Summit IX*. The Association for Machine Translation in the Americas, 2003.

[24] W. WARD, H. KRECH, X. YU, K. HEROLD, G. FIGGS, A. IKENO, D. JURAFSKY, AND W. BYRNE. Lexicon adaptation for LVCSR: speaker idiosyncracies, non-native speakers, and pronunciation choice. In *ISCA ITR Workshop on Pronunciation Modeling and Lexicon Adaptation*, 2002.

[25] S. TSAKALIDIS, V. DOUMPIOTIS, AND W. BYRNE. Discriminative linear transforms for feature normalization and speaker adaptation in HMM estimation. In *Proc. of the International Conference on Spoken Language Processing*, Denver, Colorado, USA, 2002.

[26] J. PSUTKA, P. IRCING, J. PSUTKA, V. RADOVA, W. BYRNE, J. HAJIC, S. GUSTMAN, AND B. RAMABHADRAN. Automatic transcription of Czech language oral history in the MALACH project: Resources and initial experiments. In *Proceedings of the Text, Speech, and Dialog Workshop*, 2002.

[27] D. OARD, D. DEMNER-FUSHMAN, J. HAJIC, B RAMABHADRAN, S GUSTMAN, W BYRNE, D. SOERGEL, B. DORR, P. RESNIK, AND M. PICHENEY. Cross-language access to recorded speech in the MALACH project. In *Proceedings of the Text, Speech, and Dialog Workshop*, 2002.

[28] S. KUMAR AND W. BYRNE. Risk based lattice cutting for segmental minimum Bayes-risk decoding. In *Proc. of the International Conference on Spoken Language Processing*, Denver, Colorado, USA, 2002.

[29] S. KUMAR AND W. BYRNE. Minimum Bayes-risk alignment of bilingual texts. In *Proc. of the Conference on Empirical Methods in Natural Language Processing*, Philadelphia, PA, USA, 2002.

[30] S. GUSTMAN, D. SOERGEL, D. OARD, W. BYRNE, M. PICHENY, B. RAMABHADRAN, AND D. GREENBERG. Supporting access to large digital oral history archives. In *Proceedings of the Joint Conference on Digital Libraries*, 2002.

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[31] F. ZHENG, Z. SONG, P. FUNG, AND W. BYRNE. Modeling pronunciaiton variation using context-dependent weighting and B/S refined acoustic modeling. In *Proc. of the European Conference on Speech Communication and Technology (EUROSPEECH)*, 2001.

[32] V. VENKATARAMANI AND W. BYRNE. MLLR adaptation techniques for pronunciation modeling. In *IEEE Workshop on Automatic Speech Recognition and Understanding*, Madonna di Campiglio, Italy, 2001.

[33] P. IRCING, P. KREBC, J. HAJIC, S. KHUDANPUR, F. JELINEK, J. PSUTKA, AND W. BYRNE. On large vocabulary continuous speech recognition of highly inflectional language - Czech. In *Proc. of the European Conference on Speech Communication and Technology (EUROSPEECH)*, 2001.

[34] A. GUNAWARDANA AND W. BYRNE. Convergence of DLLR rapid speaker adaptation algorithms. In *ISCA ITR-Workshop on Adaptation Methods for Automatic Speech Recognition*, 2001.

[35] A. GUNAWARDANA AND W. BYRNE. Discriminative speaker adaptation with conditional maximum likelihood linear regression. In *Proc. of the European Conference on Speech Communication and Technology (EUROSPEECH)*, 2001.

[36] V. GOEL, S. KUMAR, AND W. BYRNE. Confidence based lattice segmentation and minimum Bayes-risk decoding. In *Proc. of the European Conference on Speech Communication and Technology (EUROSPEECH)*, volume 4, pages 2569–2572, Aalborg, Denmark, 2001.

[37] W. BYRNE, V. VENKATARAMANI, T. KAMM, T.F. ZHENG, Z. SONG, P. FUNG, Y. LUI, AND U. RUHI. Automatic generation of pronunciation lexicons for Mandarin casual speech. In *IEEE Conference on Acoustics, Speech and Signal Processing*, volume 1, pages 569–572, Salt Lake City, Utah, 2001. IEEE.

[38] D. VERGYRI, S. TSAKALIDIS, AND W. BYRNE. Minimum risk acoustic clustering for multilingual acoustic model compination. In *International Conference on Spoken Language Processing*, 2000.

[39] J. MCDONOUGH AND W. BYRNE. On the incremental addition of regression classes for speaker adaptation. In *IEEE Conference on Acoustics, Speech and Signal Processing*. IEEE, 2000.

[40] A. GUNAWARDANA AND W. BYRNE. Robust estimation for rapid adaptation using discounted likelihood techniques. In *International Conference on Acoustics, Speech, and Signal Processing*. IEEE, 2000.

[41] V. GOEL, S. KUMAR, AND W. BYRNE. Segmental minimum Bayes-risk asr voting strategies. In *Proc. of the International Conference on Spoken Language Processing*, volume 3, pages 139–142, Beijing, China, 2000.

[42] W. BYRNE, P. BEYERLEIN, J. HUERTA, S. KHUDANPUR, B. MARTHI, J. MORGAN, N. PETEREK, J. PICONE, D. VERGYRI, AND W. WANG. Towards language independent acoustic modeling. In *IEEE Conference on Acoustics, Speech and Signal Processing*, pages 1029–1032, Istanbul, Turkey, 2000. IEEE.

[43] LI A., ZHENG F., W. BYRNE, P. FUNG, T. KAMM, LIU YI, SONG Z., U. RUHI, V. VENKATARAMANI, AND CHEN X. CASS: A phonetically transcribed corpus of mandarin spontaneous speech. In *Proc. of the International Conference on Spoken Language Processing*, 2000.

[44] J. MCDONOUGH AND W. BYRNE. Speaker adaptation with all-pass transforms. In *International Conference on Acoustics, Speech, and Signal Processing*. IEEE, 1999.

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[45] J. McDonough and W. Byrne. Single-pass adapted training with all-pass transforms. In *Proc. of the European Conference on Speech Communication and Technology (EUROSPEECH)*, 1999.

[46] V. Goel and W. Byrne. Task dependent loss functions in speech recognition: Application to named entity extraction. In *ESCA-ETR Workshop on accessing information in spoken audio*, 1999.

[47] V. Goel and W. Byrne. Task dependent loss functions in speech recognition: A-star search over recognition lattices. In *Proc. of the European Conference on Speech Communication and Technology (EUROSPEECH)*, 1999.

[48] V. Digalakis, S. Berkowitz, E. Bochieri, C. Boulis, W. Byrne, H. Collier, A. Corduneanu, A. Kannan, S. Khudanpur, J. McDonough, and A. Sankar. Rapid speech recognizer adaptation to new speakers. In *IEEE Conference on Acoustics, Speech and Signal Processing*. IEEE, 1999.

[49] W. Byrne, J. Hajic, P. Ircing, F. Jelinek, S. Khudanpur, J. McDonough, N. Peterek, and J. Psutka. Large vocabulary speech recognition for read and broadcast Czech. In *Proceedings of the Text, Speech, and Dialog Workshop*, 1999.

[50] W. Byrne and A. Gunawardana. Discounted likelihood linear regression for rapid adaptation. In *Proc. of the European Conference on Speech Communication and Technology (EUROSPEECH)*, 1999.

[51] W. Byrne and A. Gunawardana. Convergence of EM variants. In *IEEE Information Theory Workshop on Detection, Estimation, Classification, and Imaging*, page 64, 1999.

[52] W. Byrne, P. Beyerlein, J. Huerta, S. Khudanpur, B. Marthi, J. Morgan, N. Peterek, J. Picone, D. Vergyri, and W. Wang. Towards language independent acoustic modeling. In *IEEE Workshop on Automatic Speech Recognition and Understanding*, Keystone, Colorado, 1999.

[53] J. McDonough, W. Byrne, and X. Luo. Speaker normalization with all-pass transforms. In *International Conference on Spoken Language Processing*, 1998.

[54] V. Goel, W. Byrne, and S. Khudanpur. LVCSR rescoring with modified loss functions: a decision theoretic perspective. In *International Conference on Acoustics, Speech, and Signal Processing*. IEEE, 1998.

[55] W. Byrne, M. Finke, S. Khudanpur, A. Ljolje, J. McDonough, H. Nock H, M. Riley, M. Saraclar, C. Wooters, and G. Zavaliagkos. Stochastic pronunciation modeling from hand-labeled phonetic corpora. In *Proceedings of the Workshop on Modeling Pronunciation Variation for Automatic Speech Recognition*, 1998.

[56] W. Byrne, M. Finke, S. Khudanpur, J. McDonough, H. Nock, M. Riley, M. Saraclar, C. Wooters, and G. Zavaliagkos. Pronunciation modelling using a hand-labelled corpus for conversational speech recognition. In *IEEE International Conference on Acoustics, Speech and Signal Processing*. IEEE, 1998.

[57] W. Byrne, S. Khudanpur, E. Knodt, and J. Bernstein. Is automatic speech recognition ready for non-native speech? a data collection effort and initial experiments in modeling conversational Hispanic english. In *ESCA-ITR Workshop on speech technology in language learning*, 1997.

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[58] W. BYRNE, M. FINKE, S. KHUDANPUR, J. MCDONOUGH, H. NOCK H, M. RILEY, M. SAR-ACLAR, C. WOOTERS, AND G. ZAVALIAGKOS. Pronunciation modelling for conversational speech recognition: A status report from WS97. In *IEEE Automatic Speech Recognition and Understanding Workshop*, 1997.

[59] W. BYRNE. Information geometry and maximum likelihood criteria. In *Conference on Information Sciences and Systems*, Princeton, NJ, 1996.

[60] K. WANG, S. SHAMMA, AND W. BYRNE. Noise robustness in the auditory representation of speech signals. In *International Conference on Acoustics, Speech, and Signal Processing*. IEEE, 1993.

[61] W. BYRNE. Generalization and maximum likelihood from small data sets. In *IEEE-SP Workshop on Neural Networks in Signal Processing*, 1993.

[62] W. BYRNE, J. ROBINSON, AND S. SHAMMA. The auditory processing and recognition of speech. In *Proceedings of the Speech and Natural Language Workshop*, pages 325–331, October 1989.

[63] W. BYRNE, R. ZAPP, P. FLYNN, AND M. SIEGEL. Adaptive filtering in microwave remote heart monitors. In *IEEE Engineering in Medicine and Biology Society, Seventh annual Conference*, 1985.